Quiz #11

Physics 221

Names: _____

1. Include a diagram with each question
   a. What is the direction of the magnetic field if a current carrying wire is oriented so that the current travels along the –y axis and a force is felt in the +x direction?

   b. What is the direction of force if a current carrying wire is oriented so that electron flow is out of the page and the magnetic field is directed towards the top of the page.

$\Delta V = IR$

$C = Q/\Delta V$

$q = Q\,(1-e^{-t/RC})$

$I = \Delta Q/\Delta t$

$R_{eq} = R_1 + R_2 + R_3 + \ldots$

$q = Q\,e^{-t/RC}$

$P = I\Delta V = (\Delta V)^2/R = I^2R$

$1/R_{eq} = 1/R_1 + 1/R_2 + 1/R_3 + \ldots$

$\tau = RC$

$F = qvB\sin\theta$

$\mu_o = 1.26 \times 10^{-6}$ Tm/A

$F = IlB\sin\theta$

$B = \mu_o I/2\pi r$

2. A particle has a velocity v.
    a. How can you direct the particle into an S shaped path using magnetic fields? Use a diagram to clearly indicate direction of the fields.

    b. How does the particle's initial speed compare with its final speed?

3. Although the evidence is weak, there has been concern in recent years over possible health effects from the magnetic fields generated by transmission lines. A typical high-voltage transmission line is 20 m off the ground and carries a current of 200 A. Estimate the magnetic field strength on the ground underneath such a line. What percentage of the earth's magnetic (5×10^{-5} T) field does this represent?